

CLAIMS

1. Method for manufacturing a tyre (1) for vehicle wheels, of the type suitable for travelling on icy and/or snowy roads, said tyre comprising a tread band (34) having an external surface containing a plurality of metal studs (24, 25) partially projecting from said external surface, comprising the steps of:
 - manufacturing a green tyre;
 - 10 - inserting and retaining said studs (24, 25) into specific seats provided in a vulcanization mould;
 - inserting said green tyre into said mould;
 - closing said mould;
 - 15 - vulcanizing said green tyre;
 - opening said mould to extract the cured tyre, characterized in that the step of opening the mould is carried out providing that the studs (24, 25) incorporated into the tread band (34) of the cured tyre do not scrape on the walls of said seats, said studs (24, 25) maintaining their substantially perpendicular arrangement with respect to the external surface of said tread band (34).
2. Method according to Claim 1, characterized in that said step of retaining the studs (24, 25) into said seats is performed by a magnetic attraction force.
- 25 3. Method according to Claim 1 or 2, characterized by chemically treating said studs (24, 25) with a bonding agent prior to their insertion into said mould.
- 30 4. Method according to Claim 1 or 2, characterized by providing said studs (24, 25) with a coating layer.
5. Method according to Claim 4, characterized in that said coating layer is brass or an alloy containing Cu, Zn, Ni, Co or Mn.
- 35 6. Method according to Claim 5, characterized in that said brass layer is obtained by electrolytic plating or electro-plating.
7. Vulcanization mould for tyres, comprising:

- a pair of annularly shaped and coaxially facing cheeks;
 - a plurality of sectors (270) circumferentially distributed around said cheeks;
 - 5 - a plurality of seats which are provided in said sectors (270), each of said seats being designed to retain a corresponding stud (24, 25),
- characterized in that, with respect to said studs
- 10 (24, 25), said seats are provided with a degree of clearance allowing the cured tyre to be extracted from the mould, at the opening of the latter, without interference between said seats (270) and said studs (24, 25) to maintain their substantially
- 15 perpendicular arrangement with respect to the external surface of the tread band (34).
8. Mould according to Claim 7, characterized in that each of said seats comprises a bush (206), the internal surface of which is intended to come into
- 20 contact with an abutting shoulder (305, 306) provided on the body of said studs (24, 25).
9. Mould according to Claim 8, characterized in that said bush (206) has a conically shaped first internal portion (207) and a cylindrically shaped
- 25 second internal portion (208).
10. Mould according to Claim 9, characterized in that the inner diameter of said second internal portion (208) is greater than the diameter of the stud portion which penetrates into said bush (206).
- 30 11. Mould according to Claim 7, characterized in that each of said seats is provided with a magnet (205).
12. Mould according to Claim 11, characterized in that said magnet (205) presents a maximum energy product from 27 Oe to 30 Oe.
- 35 13. Mould according to Claim 11 or 12, characterized in that said magnet (205) does not come into contact with the corresponding stud (24, 25).
14. Stud (24, 25) for vehicle wheel tyres (1), of the type suitable for providing said tyres with optimum

road-holding properties on icy and/or snowy roads, comprising:

- a central body (301);
- a tip (303) connected to said central body (301) at a first end thereof;
- a base (304) provided on said central body (301) at a second end axially opposite with respect to said tip (303),

characterized in that said central body (301) has at least one abutting shoulder (305, 306) arranged at a predefined distance from said tip (303).

15. Stud according to Claim 14, characterized in that said at least one abutting shoulder (305, 306) is annularly shaped.
16. Stud (24, 25) according to Claim 14 or 15, characterized in that said central body (301) is provided with an end portion (302) inside of which is inserted said tip (303).
17. Stud (24, 25) according to Claim 14, characterized in that said central body (301) is made of ferromagnetic material.
18. Stud (24, 25) according to Claim 14, characterized in that said tip (303) is made of a material having a hardness greater than that of said central body (301).
19. Stud (24, 25) according to Claim 14, characterized in that said base (304) has a diameter greater than the maximum diameter of said central body (301).
20. Stud (24, 25) according to anyone of Claims from 14 to 19, characterized in that said central body (301) is provided with at least one collar.
21. Stud (24, 25) according to anyone of Claims from 14 to 20, characterized in it has a substantially cylindrical portion (307) located between said end portion (302) and said central body (301).
22. Stud (24, 25) according to Claim 21, characterized in that said substantially cylindrical portion (307) is provided with said abutting shoulder (305, 306).

23. Stud (24, 25) according to anyone of Claims from 14 to 22, characterized in that the external surface of said stud (24, 25) is covered with a bonding agent.
- 5 24. Stud (24, 25) according to anyone of Claims from 14 to 23, characterized in that it is provided with a coating layer.
- 10 25. Stud (24, 25) according to Claim 24, characterized in that said coating layer is brass or an alloy containing Cu, Zn, Ni, Co or Mn.
26. Stud (24, 25) according to Claim 25, characterized in that said brass layer is obtained by electrolytic plating or electro-plating.
- 15 27. Stud (24, 25) according to any Claim from 24 to 26, characterized in that said coating layer is from 1 μ m to 2 μ m thick.
- 20 28. Studded tyre (1) for vehicle wheels of the type suitable for travelling on icy and/or icy roads, comprising a tread band (34) which has a radially external surface and contains a plurality of studs (24, 25) partially projecting from said external surface, said studs (24, 25) having a body incorporated in said tread band (34) and a tip (303) of a material having a hardness greater than
- 25 that of said body projecting from said tread band (34), characterized in that said studs (24, 25) are bonded to the compound of said tread band (34) by means of a bonding agent provided on the bare body of said studs (24, 25).
- 30 29. Studded tyre (1) for vehicle wheels of the type suitable for travelling on icy and/or icy roads, comprising a tread band (34) which has a radially external surface and contains a plurality of studs (24, 25) partially projecting from said external
- 35 surface, said studs (24, 25) having a body incorporated in said tread band (34) and a tip (303) of a material having a hardness greater than that of said body projecting from said tread band (34), characterized in that the adhesion of said

studs (24, 25) to the compound of said tread band (34) is obtained by brass plating the bare body of said studs (24, 25).

- 5 30. Tyre (1) according to Claim 28 or 29, characterized in that said studs (24, 25) have an abutting shoulder which is located at the same level of said radially external surface.
- 10 31. Pre-moulded tread band, for re-treading worn tyres, of the type suitable for allowing said re-treaded tyres to be used for travelling on icy and/or snowy roads, said tread band having a bottom surface for assembly with said tyre and a top surface for rolling contact with the road, characterized in that it contains a plurality of studs (24, 25)
- 15 partially projecting from said external surface, said studs (24, 25) being bonded to the tread band compound by a bonding agent applied onto the bare body of said studs (24, 25).
- 20 32. Pre-moulded tread band, for re-treading worn tyres, of the type suitable for allowing said re-treaded tyres to be used for travelling on icy and/or snowy roads, said tread band having a bottom surface for assembly with said tyre and a top surface for rolling contact with the road, characterized in
- 25 that it contains a plurality of studs (24, 25) partially projecting from said external surface, said studs (24, 25) being brass plated.